

Aquatic Weeds And Water Pollution

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Aquatic weeds, which are a problem in and of themselves, are a symptom of an even greater problem—water pollution. The fact that more and more of Florida's waterways are becoming choked with aquatic weeds of one type or another is an indication that our waters are suffering from the serious and hard-to-solve problem of an excess of nutrient material.

For, like the corn we grow in our fields, aquatic plants need fertilizer. Man is conscientious in applying fertilizer to his fields and, although he does not realize it, indirectly he is conscientiously applying fertilizers to his waterways. The result is a lush crop of corn on dry land and a lush crop of aquatic weeds in his waters.

Man, however, easily can stop applying fertilizer to his fields and if he keeps on planting, the corn eventually will wither away. Not so with his waterways. It is no easy task to keep the fertilizer materials from entering our lakes, rivers and streams. So far, in fact, it has been all but impossible.

Why?

The answer is simple if the solution is not.

As with commercial fertilizers, the common nutrients entering our waterways are nitrogen and phosphorous. These nutrients come from a multitude of sources, including: domestic sewage and seepage from septic tanks, agricultural runoff (those fertilizers that never reach our corn, but are washed away with eroded soil into our streams), farm and dairy animal wastes, city storm runoff which carries lawn fertilizers and other organic material into our waterways, numerous kinds of industrial wastes, decomposing aquatic plants resulting from weed control projects, or natural causes and the decomposing bodies of fishes and other aquatic biota killed either as a "fish management" exercise or from "natural" causes.

If these excess nutrients could be removed from our waterways, there would be no need for the Hyacinth Control Society. But removing them is a very big problem. Technology for nutrient removal from even closed, controlled sources such as municipal sewerage systems is still in its infancy. The technology that exists is very expensive and represents an added cost to the already phenomenal costs of providing adequate sewage treatment for the people of Florida.

Nutrients from industrial wastes pose an equally complex treatment problem, complicated by the fact that industrial nutrients can be associated with a host of other complex and poisonous substances.

Agricultural wastes, including those from farm and dairy animals, are an entirely different problem. Usually there is no central collection point at which these wastes can be treated. They enter our waterways from a number of ill-defined locations. Fertilizers washed from our farmlands are frequently mixed with pesticides which have been sprayed onto the same crops that were fertilized. Animal wastes, in addition to being excellent sources of nutrients, have a large biochemical oxygen demand

(B.O.D.), and frequently a high bacteria count, compounding the water pollution problem.

The Florida Air & Water Pollution Control Board is strongly considering a move which will alleviate some of the State's nutrient problems. The Board is considering requiring that 90 per cent nutrient removal *or better* be provided for waste sources whose effluent discharges into confined body of water such as a lake or a slow flowing stream. This would *help* solve the nutrient problems of Florida. (Although it would not help the cities in their search for funds to provide this treatment.)

Currently, the Board is requiring 90 per cent removal of all organic materials from municipal or industrial wastes, but it is becoming very evident that in many areas of the State this will not be enough. The Board's rules regarding water pollution give it the authority to require nutrient removal as well.

I might note here that one obvious point which is often overlooked when we talk about aquatic weeds and the nutrient removal problem is that the weeds themselves are removing the nutrients from the waters. In fact, there has been a pilot project underway near Orlando for some time which is using hyacinths to remove nutrients, with very limited success.

The problem with this project, as you might suspect, isn't all with nutrient removal. It seems there are also problems with hyacinth removal. I understand, however, that the study is going to be continued.

Although a number of persons have talked about using algae and hyacinths to take up the nutrients in our waterways, they haven't yet proven that these plants are efficient "waste treatment plants" to do the job. As you well know, the problem of harvesting and removing the algae or hyacinths is far from being solved.

Of what we now consider to be the two major nutrients, nitrogen is by far the hardest to remove from our waters both from the standpoint of technology and expense. While we are removing the nitrogen from our waterways, nitrogen-fixing plants and bacteria are "working" just as hard to put it back. This is a natural phenomena which has been going on from time immemorial. Perhaps our real concern need only be the nitrogen which is being put in the water by man; it probably would be a futile fight to battle nature.

I would like to point out here that we may have been looking at the wrong things as the key to profuse aquatic weed growth. Nitrogen and phosphorous may NOT be the cause—or at least not the total cause. You and I need a number of trace elements to lead healthy lives, and we need them in rigidly defined proportions: Too much of a trace element or too little of an element, and we get sick. State Board of Conservation studies have shown the trace element iron to be the cause of Red Tide "blooms" off the Florida west coast. It is natural to suspect that some trace elements may play an important role in triggering profuse growths of aquatic plants. This is an area that needs some very careful research.

If we find that there are only one or two trace elements which cause aquatic weeds to burst into rank growths choking our waterways, we are well on our way to finding a solution to the weed problem. The most probable solution would be to find a means to limit the amounts of this element. This, coupled with phosphorous removal, may be our solution.

There are two pieces of legislation passed by the Florida Legislature this year (1969) relating directly to weed control and the Florida Air & Water Pollution Control Board. One regulates the importation, cultivation and transportation of aquatic weeds, and the other deals with pesticides.

The importation bill makes it mandatory for any person wanting to import an aquatic plant into Florida, move weeds from one body of water to another; or cultivate aquatic plants, to obtain a permit from the Florida Air & Water Pollution Control Board. This permit can be issued only after approval by the Game and Fresh Water Fish Commission, State Department of Agriculture, and an "appropriate agency, such as an aquatic vegetation laboratory" certifies that the plant will not be a danger to Florida waters. This, you will agree, will make it difficult for anyone to import more potential aquatic weed pests into Florida.

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The pesticide bill relates to weed control only in that it puts a member of this Board, the Game and Fresh Water Fish Commission and the Board of Conservation on the Department of Agriculture's Pesticide Technical Advisory Committee which advises the State Department of Agriculture on approved pesticides—including herbicides. Previously, there were no representatives from the State's conservation agencies on the pesticide committee.

This pesticide bill directs my discussion to another subject where aquatic weeds and water pollution come close together: Weed control and herbicides.

The common conception of a herbicide is that it is a material which kills only plants. This is far from being true as a look at the Florida Air & Water Pollution Control records on fish kills will tell you. Herbicides are poisons. Some of them are extremely toxic, not only to plants, but to invertebrate and fish life as well. In addition, fish kills may occur because of oxygen depletion caused by the rapid decomposition of aquatic weeds killed by a herbicide application.

In the past two months, the Florida Air and Water Pollution Control Board has issued two citations as a result of fish kills caused by aquatic weed spraying. One citation was a private applicator company, working for a municipality, and the other a Drainage District. In both instances, State Game and Fresh Water Fish Commission officers, acting as agents of the Pollution Control Board, saw the fish kills in progress as a result of the spraying application. The problem isn't only the lethal concentrations of herbicides that occasionally—through carelessness or ignorance—get dumped into our waterways. There is the problem of residues. It is well known that many aquatic animals have the ability to store, and concentrate, minute amounts of pesticides. When these animals are eaten, the predator receives its concentrated dose of pesticide—or group of pesticides. This can be passed on up the so-called food chain, all the way to man.

The problem of pesticides and herbicides in water can be serious. We hope the future will provide safer chemicals, techniques for utilizing aquatic weeds, or successful mechanical or biological control.

The Rules of the Board, Chapter 28-5 Section 5.02 prohibits presence of toxic substances which are harmful to animal, plant, or aquatic life in Florida waters.

To summarize our dilemma three facts are noted:

1. The toxic prohibition is in the regulation.
2. It is very doubtful if the regulation will be changed to accommodate the concentrations of *toxic* substances which can do harm.
3. If a fish kill or other incidents occur as a result of the presence of toxic substances, the Board is charged by law to enforce compliance.

It seems that weed control and pollution control are forced into opposite positions in some situations.

Recognizing this difficult position, the Board is vitally interested in development of modes of weed control which are economical, yet safe. In line with this I have asked the Hyacinth Control Society, through Mr. John Woods, to set up a study committee in order to explore the aquatic weed control problem as it relates to pollution control.

Hopefully such a committee would represent private individuals, applicators, State, Federal and local agencies who have the problem, producers of chemicals or control machinery, and regulatory agencies. One of the goals of the committee would be to develop guidelines or recommended practices for aquatic weed control procedures.